OPERATING SUMMARY

# 1974



TOWN OF

# INGERSOLL

WATER POLLUTION CONTROL PLANT

Ontario

MINISTRY OF THE ENVIRONMENT

MINISTER
Honourable William G. Newman

DEPUTY MINISTER
E. Biggs

ASSISTANT DEPUTY MINISTER
REGIONAL OPERATIONS
J. Barr

REGIONAL OPERATIONS DIVISION

DIRECTOR, SOUTHWESTERN REGION
D. McTavish

MANAGER, UTILITY OPERATIONS
A. Ladbrooke

# INGERSOLL

# WATER POLLUTION CONTROL PLANT

MINISTRY OF THE ENVIRONMENT

## 1974 ANNUAL OPERATING SUMMARY

prepared by
Plant Performance Unit
TECHNICAL SERVICES BRANCH
T. Cross, Director

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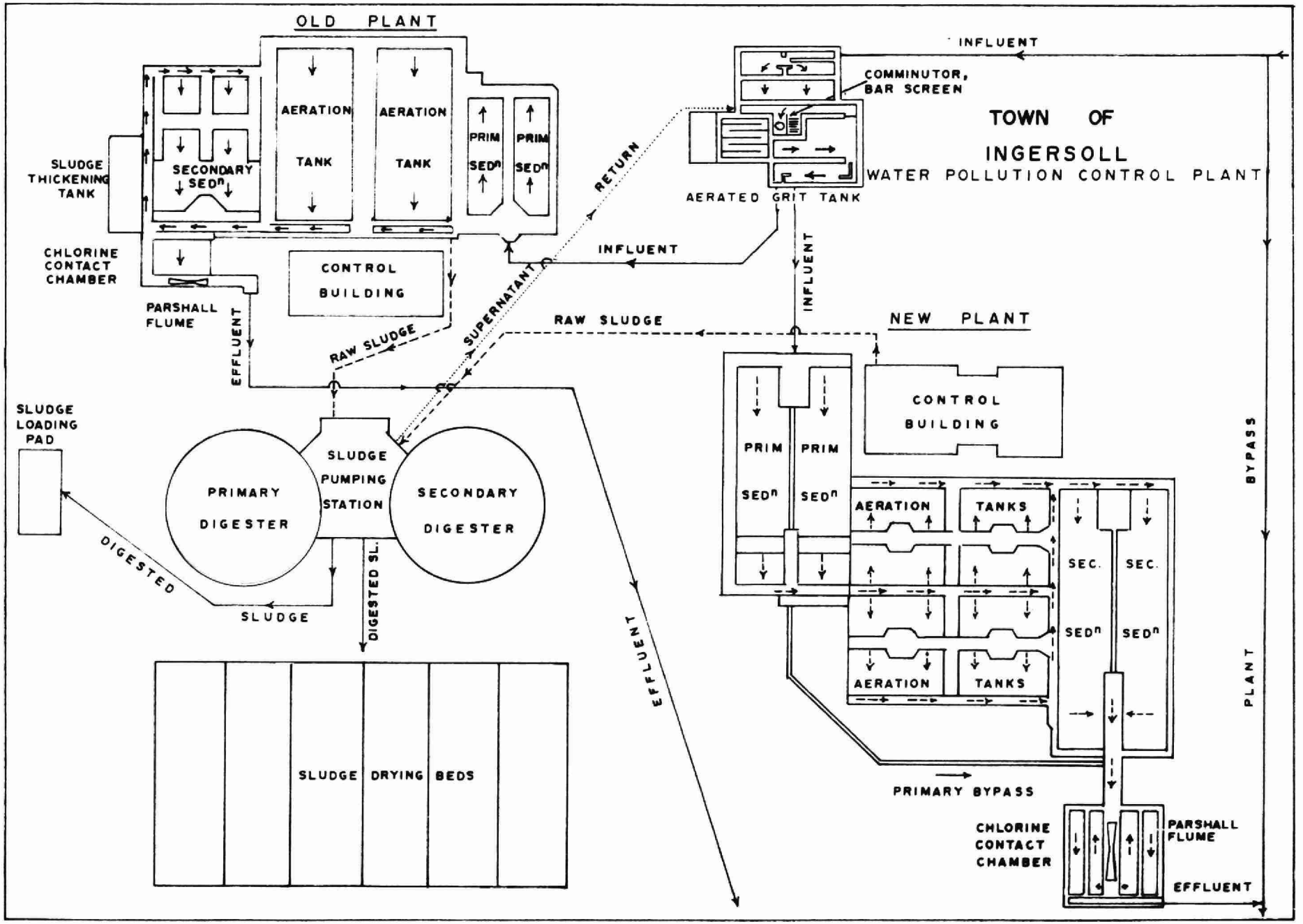
OLD PLANT
INFLUENT
COMMINUTOR, BAR SCREEN
TOWN OF
INGERSOLL
WATER POLLUTION CONTROL PLANT
AERATION TANK
AERATION TANK
PRIM SEDn
PRIM SEDn
SECONDARY SEDn
SLUDGE THICKENING TANK
RETURN
AERATED GRIT TANK
CHLORINE CONTACT CHAMBER
CONTROL BUILDING
INFLUENT
INFLUENT
PARSHALL FLUME
EFFLUENT
RAW SLUDGE
SUPERNATANT
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NEW PLANT
SLUDGE LOADING PAD
PRIM SEDn
PRIM SEDn
CONTROL BUILDING
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DIGESTED SL.
EFFLUENT
PLANT
PRIMARY BYPASS
CHLORINE CONTACT CHAMBER
PARSHALL FLUME
EFFLUENT
SLUDGE DRYING BEDS

# DESIGN DATA

**Project Town of Ingersoll WPCP**

| | |
|---|---|
| Project No: | 1-0076-67 |
| Treatment: | Conventional Activated Sludge |
| Design Flow: | 2.25 MGD<br>(Old Plant 0.75 MGD -<br>New plant 1.5 MGD) |
| BOD: | Raw sewage 200 mg/l |
| SS: | Raw sewage 200 mg/l |

PRETREATMENT (Common)

BAR SCREENS:
Manually cleaned, in wet well influent channel

RAW SEWAGE PUMPING:
Two, size 1120 USGPM
Two, size 2240 USGPM

COMMINUTION:
One comminutor, Capacity 6.75 MGD

GRIT REMOVAL:
Aerated grit tank
Size: 11'8" x 14' x 10' awd
Volume: 10500 I. Gal. Detention: 1.8 min.

OLD PLANT

PRIMARY SEDIMENTATION:
Two, each 12' x 40' x 10' swd (avg)
Volume: 60,000 I. Gal. Detention: 1.9 hours
Overflow rate: 780 I. Gal/day/sq. ft.

AERATION TANKS:
Two, each 30' x 54' x 15' swd (avg)
Volume: 300,000 I. Gal. Detention: 9.7 hours
Fine bubble diffusion
Blowers: Two, size: each 764 cfm at 7.5 psi

SECONDARY SEDIMENTATION:
Two, 15' x 45' x 12' swd (avg)
Volume: 100,000 I. Gal. Detention: 3.2 hours
Overflow rate: 550 gal/day/sq. ft.

CHLORINE CONTACT CHAMBER:
Size: 18' x 12' x 11' swd
Volume: 13,000 I. Gal. Detention: 25 min.

SLUDGE HOLDING TANK:
Size : 11' x 25' x 12'6" swd
Volume: 22,000 I. Gal.

NEW PLANT

PRIMARY SEDIMENTATION:

Two, 16' x 65' x 11' swd (avg)
Volume: 142,000 I. Gal.
Detention: 2.3 hours
Overflow rate: 720 I. gal/$ft^2$/day

AERATION TANKS:
Two, each with two cells 30' square x 13' swd
Volume: 270,000 I. Gal.
Detention: 4.3 hours

SECONDARY SEDIMENTATION:
Two, each 16' x 78' x 12' swd
Volume: 187,000 I. Gal.
Detention: 3 hours
Overflow rate: 600 I. Gal/$ft^2$/day

CHLORINE CONTACT CHAMBER:
Size: 26'6" x 24' x 10'3" swd
Volume: 41000 I. Gal.
Detention: 35 min.

SLUDGE HANDLING (Common)

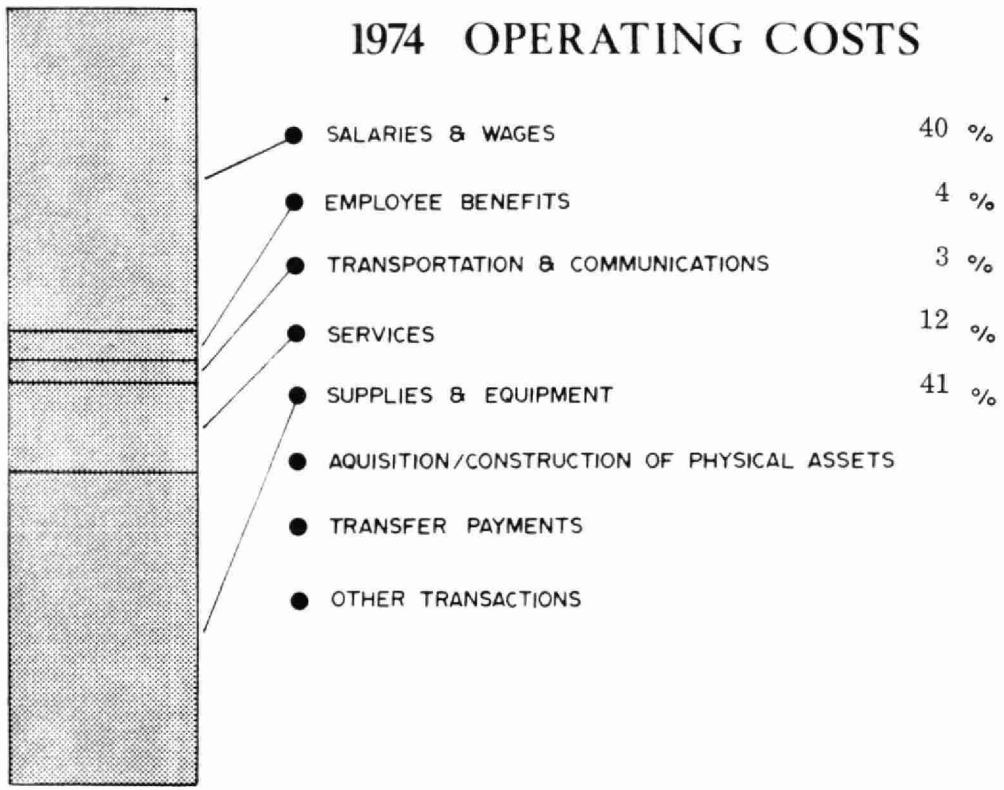
PRIMARY DIGESTER:
Size 45' dia. x 21'3" swd
Volume: 36,000 $ft^3$.

SECONDARY DIGESTER:
Size: 45' dia. x 20'3" swd
Volume: 35,000 $ft^3$

SLUDGE DRYING BEDS:
Six, each 20' x 75'
Area: 9000 $ft^2$.

# ANNUAL COSTS

## 1974 OPERATING COSTS




### YEARLY OPERATING COSTS

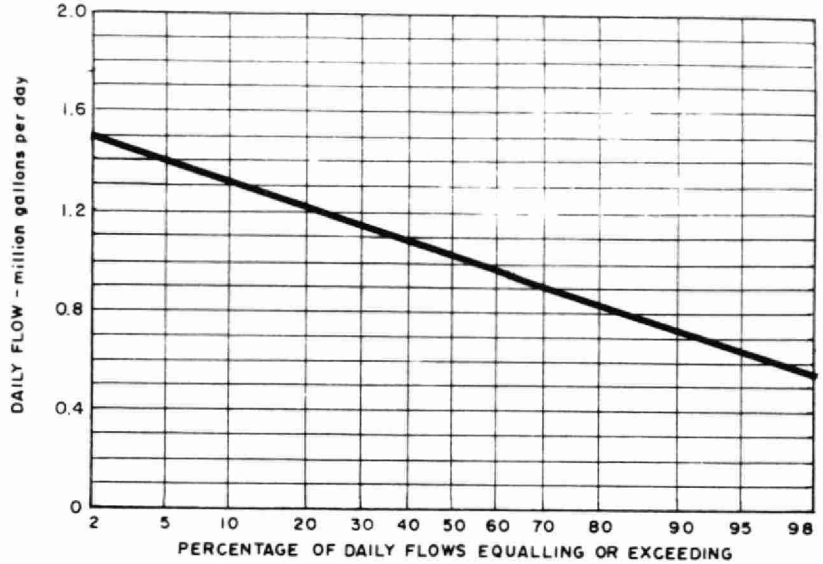
| YEAR | SEWAGE TREATED in million gallons | TOTAL OPERATING COSTS | UNIT COSTS $/M.G. | UNIT COSTS ¢/lb BOD |
|---|---|---|---|---|
| 1974 | 356.7 | 98,141 | 275 | 17 |

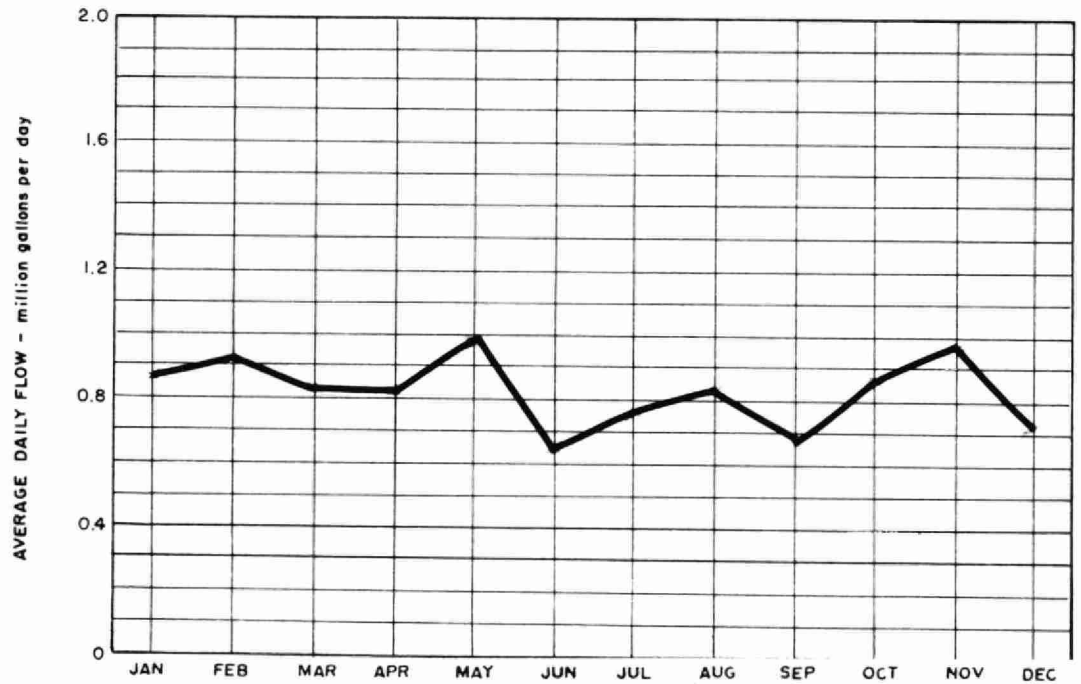
# OPERATING EXPENDITURES

| | | |
|---|---|---|
| Regular Staff | $ 34,083 | $ |
| Casual (Unclassified) Staff | 5,386 | |
| TOTAL SALARIES AND WAGES | | 39,469 |
| TOTAL EMPLOYEE BENEFITS | | 3,519 |
| TOTAL TRANSPORTATION AND COMMUNICATIONS | | 2,835 |
| Insurance | 1,250 | |
| Sludge Haulage | 6,302 | |
| Repairs and Maintenance | 3,864 | |
| Other Services | 642 | |
| TOTAL SERVICES | | 12,058 |
| Machinery and Equipment | 12,312 | |
| Chemicals | 3,073 | |
| Utilities | 17,475 | |
| Other Supplies and Equipment | 7,342 | |
| TOTAL SUPPLIES AND EQUIPMENT | | 40,202 |
| TOTAL AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS | | - |
| TOTAL TRANSFER PAYMENTS | | - |
| OTHER TRANSACTIONS | | 58 |
| GRAND TOTAL | GRAND TOTAL | $ 98,141 |

PROCESS DATA

# FLOWS




DESIGN CAPACITY _ _ _ _ _ _ _

# OLD PLANT
# PLANT PERFORMANCE

| MONTH | FLOWS | | | BIOCHEMICAL OXYGEN DEMAND | | | | SUSPENDED SOLIDS | | | | PHOSPHORUS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL FLOW | AVERAGE DAY | MAXIMUM DAY | INFLUENT | EFFLUENT | REDUCTION | | INFLUENT | EFFLUENT | REDUCTION | | INFLUENT | EFFLUENT |
| | million gallons | mil. gal | mgd | mg/l | mg/l | % | $10^3$ pounds | mg/l | mg/l | % | $10^3$ pounds | mg/l P | mg/l P |
| JAN | 3.57 | .15 | .31 | 146 | 3 | 98 | 5 | 248 | 6 | 98 | 9 | 4.8 | .6 |
| FEB | 5.68 | .25 | .43 | 176 | 30 | 83 | 8 | 346 | 15 | 96 | 19 | 5.4 | .5 |
| MAR | 7.60 | .38 | .54 | 82 | 4 | 95 | 6 | 177 | 13 | 93 | 12 | 3.4 | .7 |
| APR | 7.69 | .34 | .61 | 200 | 7 | 97 | 15 | 430 | 8 | 98 | 32 | 10.6 | .5 |
| MAY | 3.36 | .28 | .35 | 61 | 7 | 89 | 2 | 215 | 1 | 99 | 7 | 1.6 | .2 |
| JUNE | 8.33 | .28 | .32 | 115 | 4 | 96 | 9 | 120 | 5 | 96 | 10 | 4.4 | .5 |
| JULY | 8.44 | .27 | .39 | 133 | 2 | 98 | 11 | 230 | 5 | 98 | 19 | 4.8 | 1.2 |
| AUG | 9.33 | .30 | .44 | 168 | 4 | 98 | 15 | 238 | 5 | 98 | 22 | 6.4 | .6 |
| SEPT | 5.09 | .34 | .42 | 162 | 4 | 97 | 8 | 290 | 5 | 98 | 14 | 6.9 | .7 |
| OCT | .54 | | .34 | 320 | 5 | 98 | - | 430 | 5 | 99 | - | 12.0 | .3 |
| NOV | o/s | | | | | | | | | | | o/s | o/s |
| DEC | o/s | | | | | | | | | | | o/s | o/s |
| TOTAL | 59.63 | - | - | - | - | - | 86 | - | - | - | 158 | - | - |
| AVG. | | .28 | MAXIMUM .61 | 150 | 6 | 96 | | 272 | 7 | 98 | | 5.8 | .6 |
| No. of Samples | - | - | - | 35 | 28 | - | - | 35 | 28 | - | - | 35 | 28 |

# NEW PLANT

# PLANT PERFORMANCE

| MONTH | FLOWS | | | BIOCHEMICAL OXYGEN DEMAND | | | | SUSPENDED SOLIDS | | | | PHOSPHORUS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL FLOW | AVERAGE DAY | MAXIMUM DAY | INFLUENT | EFFLUENT | REDUCTION | | INFLUENT | EFFLUENT | REDUCTION | | INFLUENT | EFFLUENT |
| | million gallons | mil. gal | mgd | mg/l | mg/l | % | $10^3$ pounds | mg/l | mg/l | % | $10^3$ pounds | mg/l P | mg/l P |
| JAN | 27.0 | .87 | 1.46 | 146 | 6 | 96 | 38 | 259 | 49 | 81 | 57 | 4.9 | .9 |
| FEB | 25.5 | .91 | 1.02 | 176 | 18 | 90 | 40 | 304 | 16 | 95 | 73 | 5.4 | .8 |
| MAR | 20.2 | .84 | 1.00 | 82 | 4 | 95 | 16 | 170 | 11 | 94 | 32 | 3.4 | .7 |
| APR | 25.5 | .85 | 1.20 | 200 | 12 | 94 | 48 | 430 | 15 | 97 | 106 | 10.6 | .3 |
| MAY | 30.6 | .99 | 1.59 | 61 | 14 | 97 | 14 | 215 | 7 | 97 | 64 | 1.6 | .3 |
| JUNE | 19.4 | .65 | .93 | 115 | 3 | 97 | 22 | 300 | 5 | 98 | 57 | 4.3 | .7 |
| JULY | 24.0 | .77 | 1.09 | 132 | 3 | 98 | 31 | 230 | 5 | 98 | 54 | 12.2 | 1.5 |
| AUG | 25.9 | .84 | 1.87 | 168 | 9 | 95 | 41 | 272 | 16 | 94 | 66 | 6.4 | 2.0 |
| SEPT | 20.4 | .68 | 1.02 | 163 | 6 | 96 | 32 | 274 | 16 | 94 | 53 | 6.9 | 2.8 |
| OCT | 27.1 | .87 | 1.07 | 308 | 13 | 96 | 80 | 310 | 11 | 96 | 81 | 8.4 | .6 |
| NOV | 29.3 | .98 | 1.53 | 250 | 15 | 94 | 69 | 198 | 9 | 95 | 55 | 7.0 | 2.1 |
| DEC | 22.2 | .72 | .92 | 108 | 21 | 81 | 19 | 336 | 9 | 97 | 73 | 5.9 | 2.0 |
| TOTAL | 297.1 | - | - | - | - | - | 475 | - | - | - | 752 | - | - |
| AVG. | | .83 | MAXIMUM 1.87 | 170 | 10 | 94 | 40 | 269 | 16 | 94 | 63 | 6.7 | 1.2 |
| No. of Samples | - | - | - | 46 | 44 | - | - | 61 | 61 | - | - | 46 | 46 |

# TREATMENT DATA

| | OLD PLANT | | | | | NEW PLANT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PRIMARY EFFLUENT | | AERATION | | | PRIMARY EFFLUENT | | AERATION | | | HOLDING TANK | | | | |
| | | | | | | | | | | | DIGESTED SLUDGE | | | SUPER- | |
| MONTH | BOD mg/l | SUSPENDED SOLIDS mg/l | MLSS CONC mg/l | F/M $day^{-1}$ | AIR $\frac{1000\ ft^3}{lb\ BOD}$ | BOD mg/l | SUSPENDED SOLIDS mg/l | MLSS CONC mg/l | F/M $day^{-1}$ | AIR $\frac{1000\ ft^3}{lb\ BOD}$ | QUANTITY $10^3$ gallons | TOTAL SOLIDS % | VOL. SOLIDS % | NATANT T.S. % | AMOUNT HAULED cubic yards |
| JAN | 89 | 78 | 4900 | .01 | - | 89 | 78 | 2900 | .09 | | 0 | 2.2 | 4.4 | - | 0 |
| FEB | 60 | 74 | 3100 | .02 | - | 60 | 74 | 2000 | .10 | | 0 | 5.0 | - | - | 0 |
| MAR | 39 | 87 | 3400 | .01 | 7.5 | 39 | 87 | 2400 | .05 | | 0 | 3.6 | - | - | 0 |
| APR | 43 | 40 | 5100 | .01 | 8.4 | 43 | 80 | 3900 | .03 | | 0 | 2.0 | - | - | 0 |
| MAY | 43 | 35 | 5000 | .01 | 11.0 | 43 | 35 | 3000 | .05 | | 0 | 2.4 | - | - | 0 |
| JUNE | 45 | 50 | 3400 | .01 | 7.8 | 45 | 50 | 2100 | .05 | | 9.4 | 2.5 | - | - | 56 |
| JULY | 66 | 46 | 2000 | .03 | 5.2 | 65 | 46 | 2500 | .07 | | 14.0 | 4.5 | - | - | 84 |
| AUG | - | - | 3200 | .05 | 2.0 | 107 | 61 | 2200 | .17 | | 15.4 | 2.2 | - | - | 92 |
| SEPT | - | - | 2800 | - | - | 49 | 57 | 2400 | .05 | | 0 | - | - | - | 0 |
| OCT | - | - | 5000 | - | - | 131 | 74 | 2400 | .17 | | 0 | 4.2 | - | - | 0 |
| NOV | - | - | o/s | - | - | 108 | 81 | 2600 | .15 | | 0 | - | - | - | 0 |
| DEC | - | - | o/s | - | - | 100 | 70 | 2200 | .12 | | 0 | - | - | - | 0 |
| TOTAL | - | - | - | - | - | - | - | - | - | - | 38.8 | - | - | - | 232 |
| AVG. | 58 | 68 | 3800 | .02 | 7.0 | 76 | 69 | 2600 | .09 | | | 3.3 | 4.4 | | |

# TREATMENT DATA

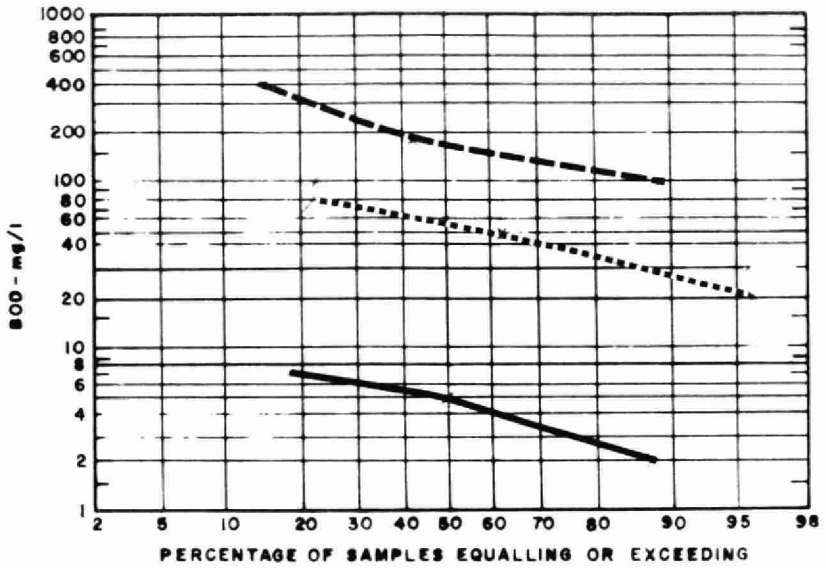
| MONTH | GRIT | CHLORINATION | | SLUDGE DIGESTION and DISPOSAL | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | RAW SLUDGE | | | DIGESTED SLUDGE | | | SUPER-NATANT | |
| | QUANTITY REMOVED cubic feet | $Cl_2$ USED $10^3$ pounds | AVG. DOSE mg/l | QUANTITY $10^3$ gallons | TOTAL SOLIDS % | VOL. SOLIDS % | QUANTITY $10^3$ gallons | TOTAL SOLIDS % | VOL. SOLIDS % | T. S. % | AMOUNT HAULED cubic yards |
| JAN | 53 | 1.0 | 3.2 | 107 | 2.2 | - | 31.4 | 2.5 | 44 | | 186 |
| FEB | 48 | 1.1 | 3.6 | 97 | 7.0 | - | 64.4 | 5.0 | - | - | 384 |
| MAR | 103 | 0.7 | 2.5 | 126 | 5.4 | - | 14.0 | 3.6 | - | - | 84 |
| APR | 74 | 1.3 | 3.9 | 171 | 4.5 | | 8.4 | 2.0 | - | - | 50 |
| MAY | 72 | 1.3 | 3.8 | 212 | 3.5 | | 39.2 | 2.4 | - | - | 232 |
| JUNE | 54 | 0.9 | 3.2 | 517 | - | - | 56.0 | 2.5 | - | - | 336 |
| JULY | 112 | 0.9 | 2.8 | 320 | 4.9 | - | 49.0 | 4.4 | | | 294 |
| AUG | 54 | 1.2 | 3.4 | 200 | 4.0 | | 74.0 | 2.2 | | | 441 |
| SEPT | 0 | 0.8 | 3.1 | 140 | 2.8 | | 28.0 | - | - | | 168 |
| OCT | 0 | 0.9 | 3.3 | 174 | 2.8 | | 28.0 | 5.4 | | | 168 |
| NOV | 47 | 1.1 | 3.8 | 169 | 3.1 | | 81.2 | - | | | 484 |
| DEC | 54 | 0.9 | 4.1 | 153 | - | | 116.2 | 1.4 | | | 691 |
| TOTAL | 671 | 12.1 | - | 2386 | - | - | 589.8 | - | - | - | 3518 |
| AVG. | cu.ft/mil gal | - | 3.4 | 199 | 4.0 | - | 49 | 3.4 | 44 | | 293 |

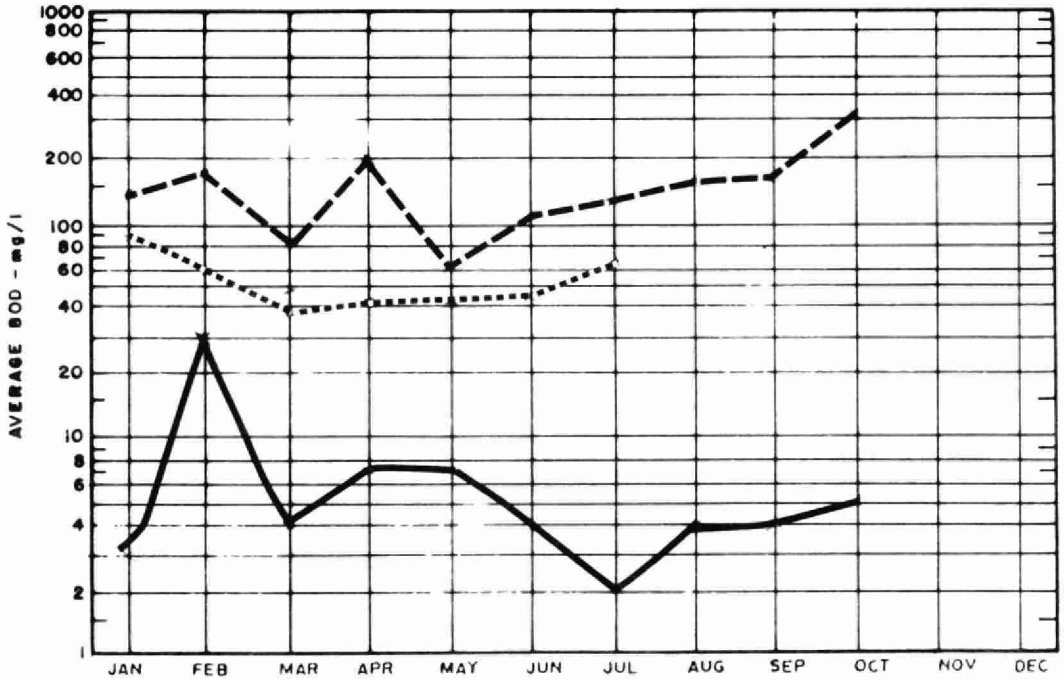
* Grit, Chlorination and Sludge Digestion data are common to both old and new plants.

# OPERATING GRAPHS

## OLD PLANT

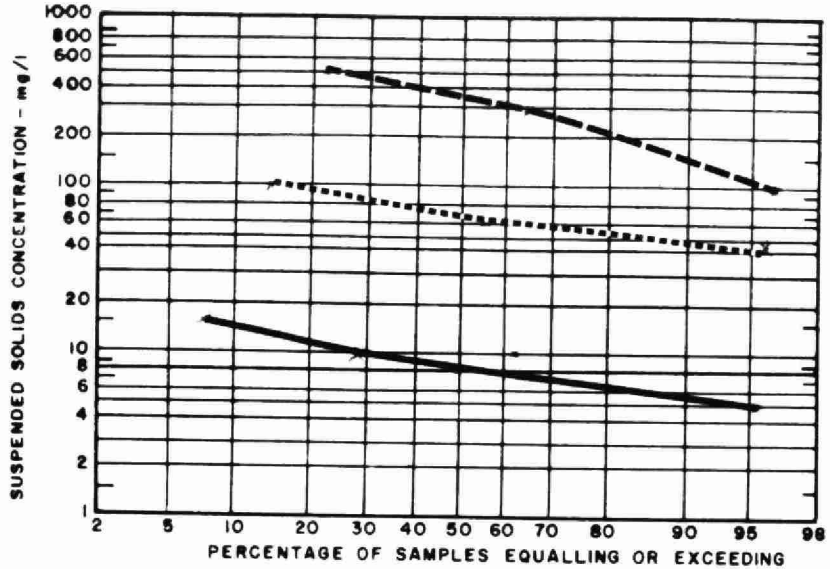
# BIOCHEMICAL OXYGEN DEMAND



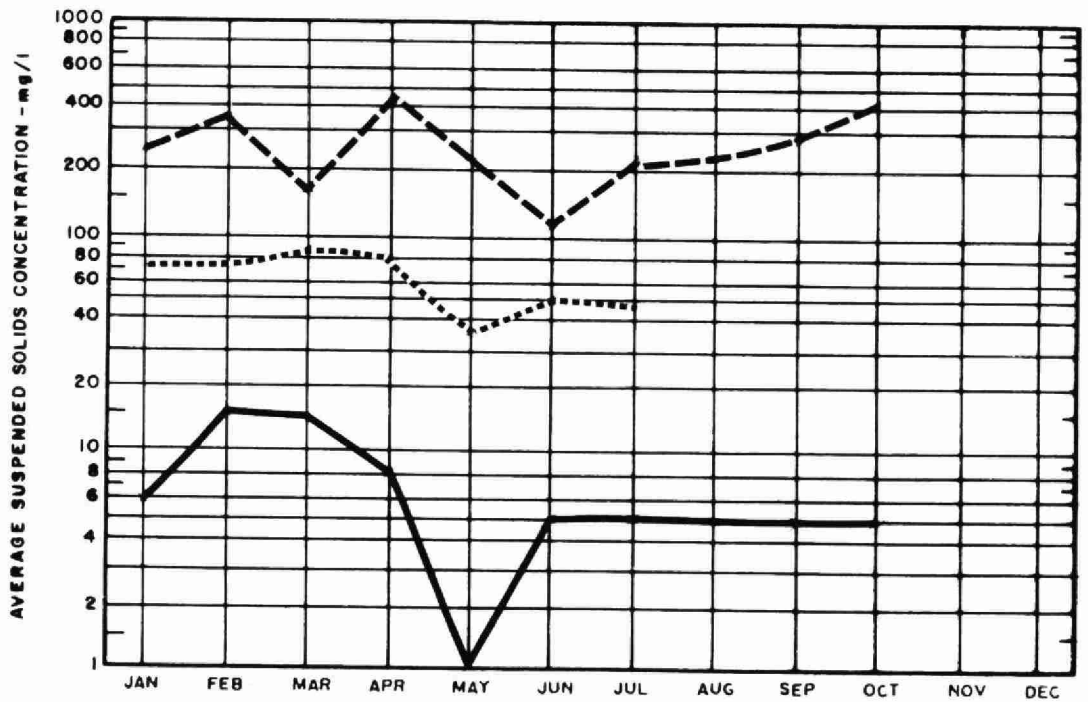




PLANT INFLUENT
PRIMARY EFFLUENT
PLANT EFFLUENT

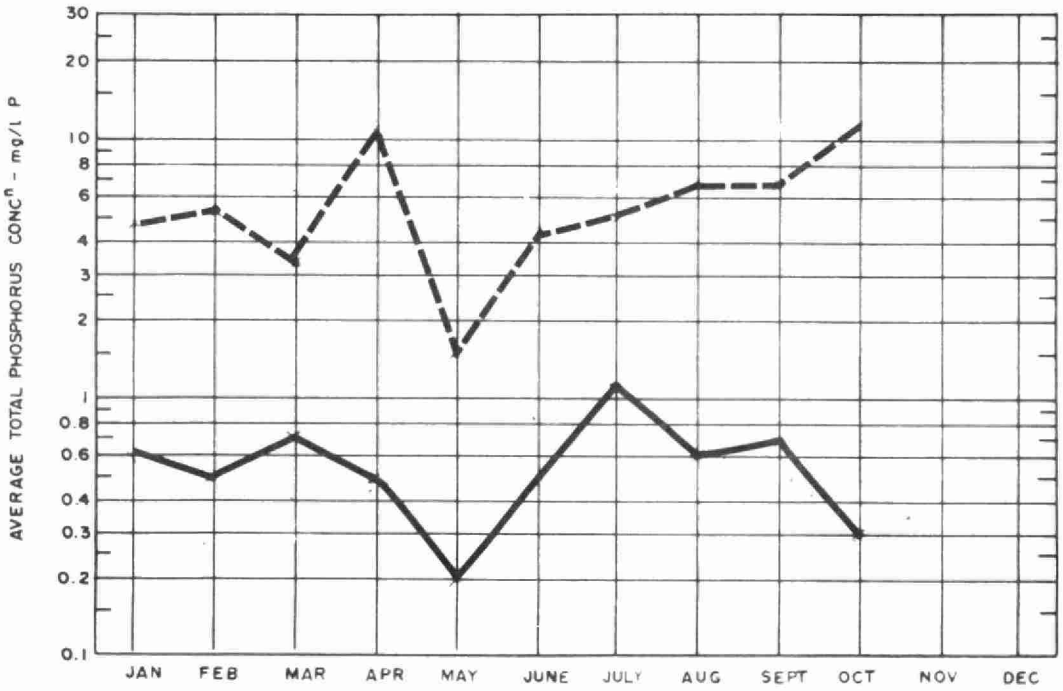
# SUSPENDED SOLIDS







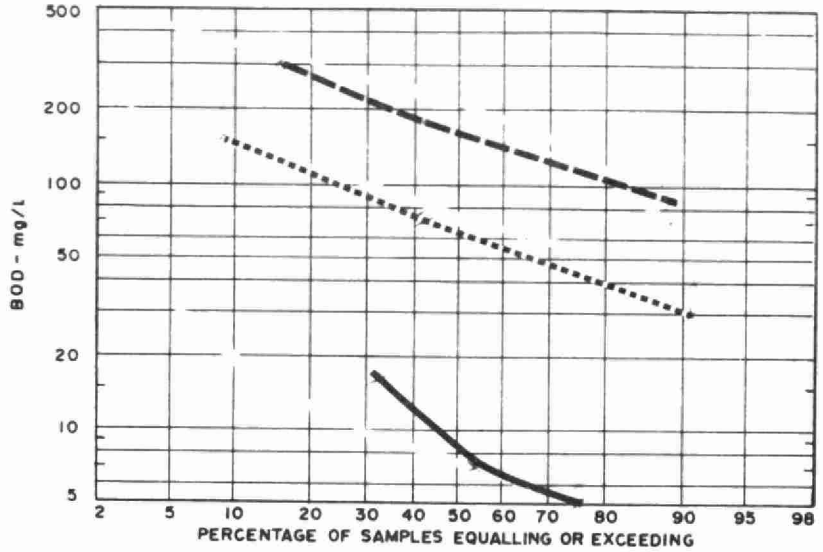
# PHOSPHORUS

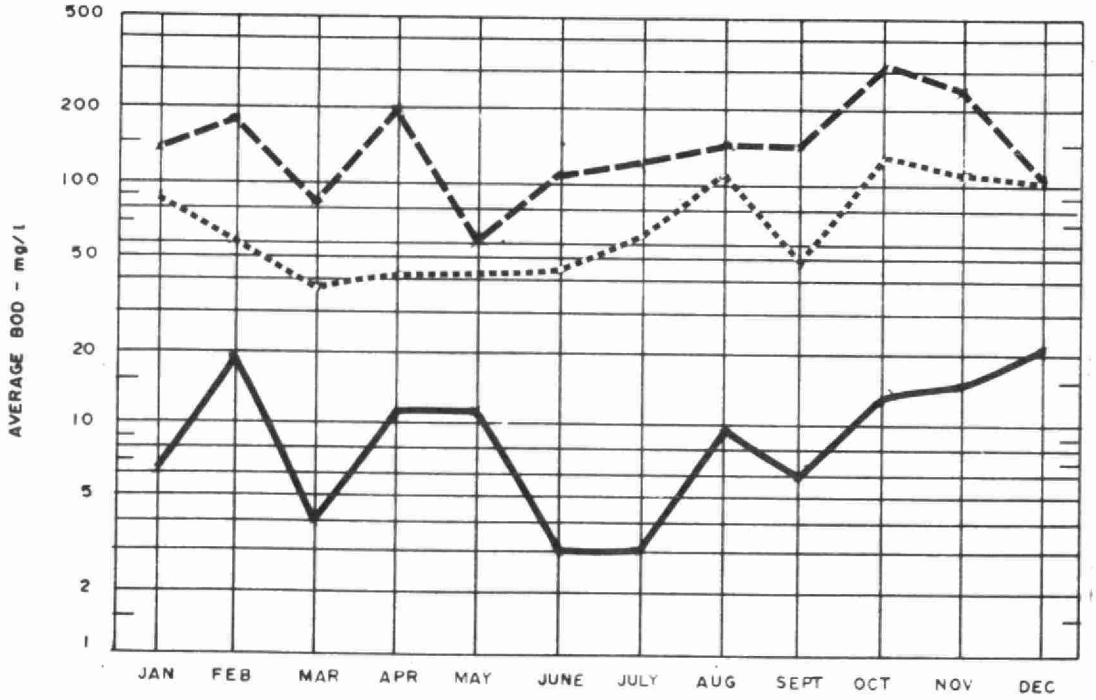

AVERAGE TOTAL PHOSPHORUS CONCⁿ - mg/l P
30
20
10
8
6
4
3
2
1
0.8
0.6
0.4
0.3
0.2
0.1
JAN
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC
PLANT INFLUENT
PLANT EFFLUENT

# OPERATING GRAPHS

## NEW PLANT

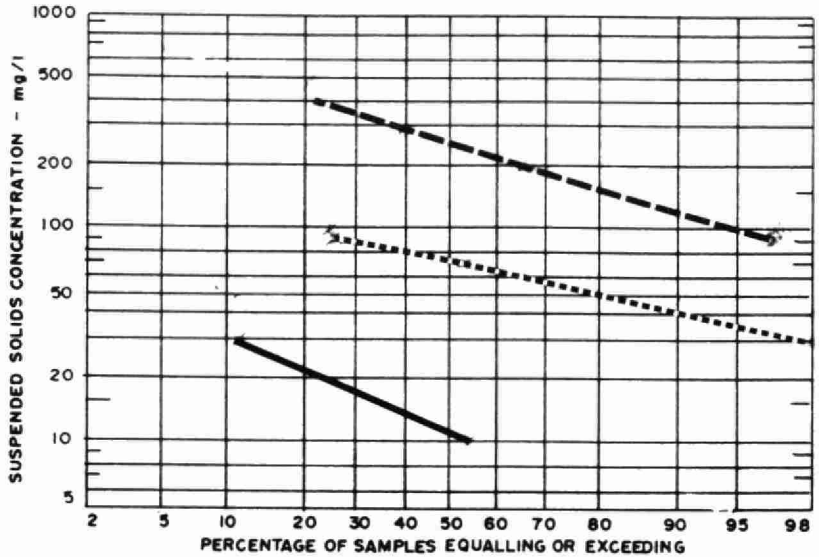
# BIOCHEMICAL OXYGEN DEMAND

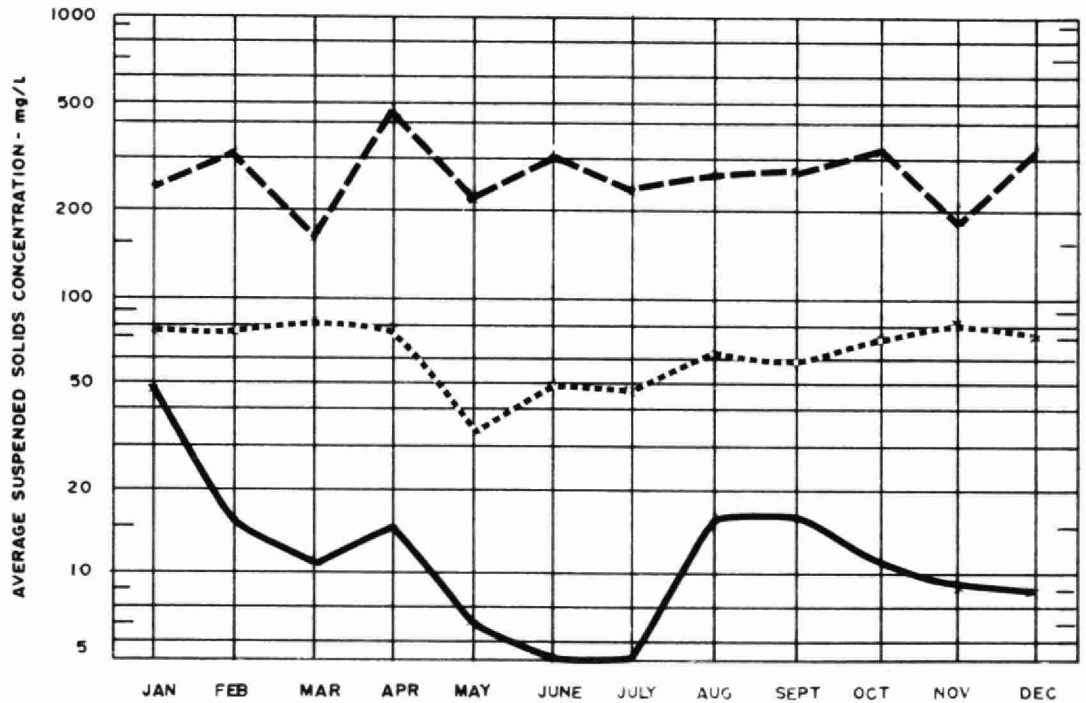



PLANT INFLUENT
PRIMARY EFFLUENT
PLANT EFFLUENT

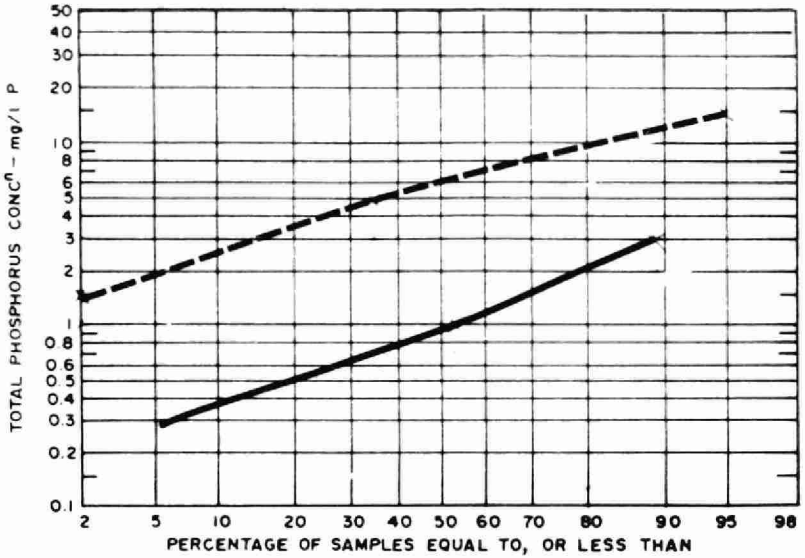
# SUSPENDED SOLIDS

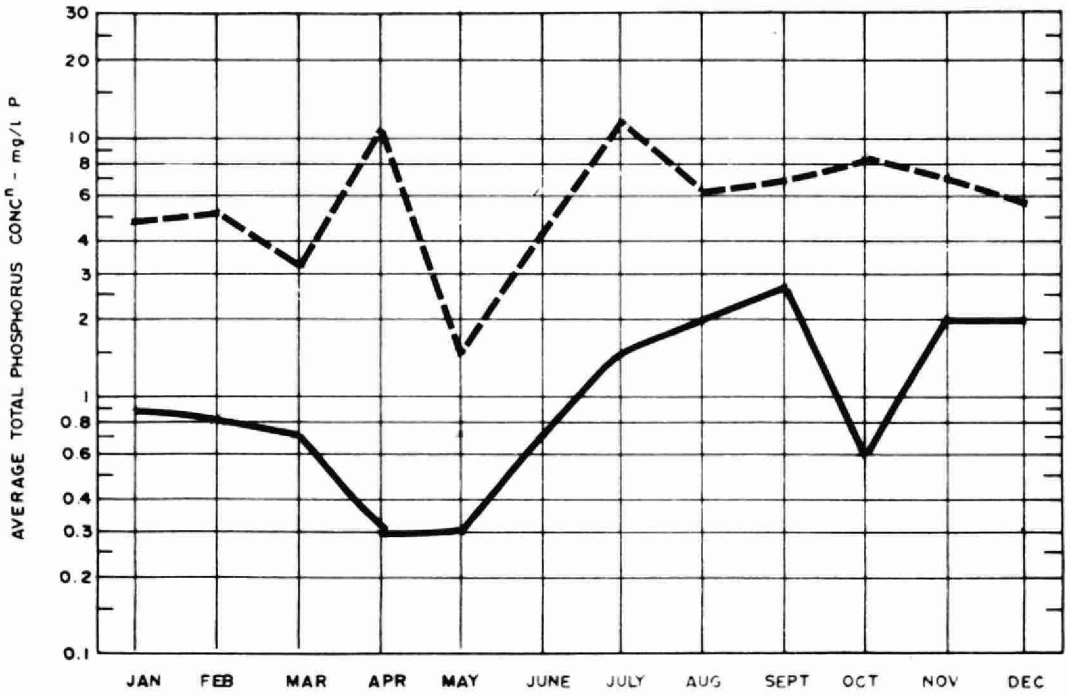



PLANT INFLUENT
PRIMARY EFFLUENT
PLANT EFFLUENT

# PHOSPHORUS




PLANT INFLUENT

PLANT EFFLUENT

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